

# The Development of Metacognitive Reading Awareness Inventory

*Mariel Hope Chen  
Paul Jerik Gualberto  
Cheyenne Led Tameta  
De La Salle University - Manila*

**TESOL Journal**  
**Vol. 1, pp. 43-57**  
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## Abstract

The present study was designed to explore the tertiary level students' reading awareness. The development of a new self-report instrument, the Metacognitive Reading Awareness Inventory, intends to assess college students' reading awareness in reading academic or school-related materials. There were five components or subscales of reading: Phonemic Awareness, Phonics, Reading Fluency, Vocabulary Development, and Reading Comprehension. A total of 300 participants were selected through random sampling. The reliability and factorial validity of the scale were demonstrated. The data analysis showed that the test has a Cronbach's Alpha of .49. Confirmatory Factor Analysis was made use to test the validity of the scale. Results revealed that the five factors are under metacognitive reading awareness which proves that Phonemic Awareness, Phonics, Reading Fluency, Vocabulary Development, and Reading Comprehension, whether in higher or lower order thinking skills are part of the reading process which involve metacognition.

## Introduction

Metacognition in literacy learning has received much attention in the literature in the last 15 to 20 years (Schmitt, 1990). Writers have noted, however, that metacognition is perhaps not a new construct but rather a new label for the age-old concept of reflective problem solving (e.g., Baker & Brown, 1984; Schmitt, 1986; Smith, 1994).

Recent trends within the domain of reading comprehension have led to an increasing emphasis on the role of metacognitive awareness of one's cognitive and motivational processes while reading (Alexander & Jetton, 2000; Guthrie & Wigfield, 1999; Pressley, 2000; Pressley & Afflerbach, 1995). Baker and Brown (1984) insist that such awareness is a "prerequisite for self-regulation, the ability to monitor and check one's own cognitive activities while reading" (p.376), and they refer to the awareness as metacognitive knowledge. Metacognitive awareness, or metacognition, was first defined by Flavell (1979) as one's ability to understand, control, and manipulate his own cognitive process to maximize learning. In addition, he described the process of cognitive monitoring as occurring through the actions and interactions of four classes or interrelated phenomena: Metacognitive knowledge, metacognitive experiences, goals (or tasks), and actions (or strategies).



involves the transformation of information and ideas while lower-order thinking occurs when students are asked to receive or recite factual information or to employ rules and algorithms through repetitive routines.”

Moreover, Whittington (1995) compared the bloom’s taxonomy, the Newcomb-Trefz model of learning, and the two level thinking skill models. The results show that Blooms knowledge is equivalent to Newcomb’s remembering and it falls under lower level thinking skill. Bloom’s comprehension, application, and analysis falls under Newcomb’s processing and are also under lower level thinking skills. Bloom’s synthesis is equivalent to Newcomb’s creating and is under higher order thinking skill. Bloom’s evaluation is equivalent to Newcomb’s evaluating and is under higher order thinking skills.

According to Madaus, et al. (1971), Benjamin Bloom defined his taxonomy into six major levels namely: knowledge, comprehension, application, analysis, synthesis and evaluation. This is arranged from simple to complex manner based on the cognitive domain. Karns et al (1983) stated that knowledge is “achieved by rote memory of simple rules, facts, terminologies, sequences, and principles” (p.18). In addition, comprehension is wherein the “student restates the problem in his/her own words, gives an example of a principle, or extrapolates a trend” (p.18). On the other hand, application is when “student must be able to apply a principle to some new problem” (p.18). Analysis “involves the breakdown of a communication into its constituent elements, finding assumptions, identifying causal relationships, and distinguishing facts from opinions” (p.18). Synthesis involves developing a prediction (p.19). Lastly, evaluation “demands value judgments evolving from critical evaluation of information and theories” (p. 19). Reading bestows cognitive effects which can be quoted from the “more you read, the more you learn.” Smith (1994) emphasized that “literacy skills are used to accomplish a variety of tasks that involve reading such as acquiring knowledge, relaxing with leisure activities, solving work related tasks and becoming performed citizens.”

Schmitt (1990) developed the Metacomprehension Strategy Index to determine the students’ levels of strategy awareness namely: Predicting and verifying, Previewing, Purpose setting, Self-questioning, Drawing from background knowledge, Summarizing and applying fix-up strategies. The results showed that there was lack of significant difference in the categories as a whole; there were a few questions that revealed differences between the children who had successfully completed Reading Recovery and the cohort sample group with respect to knowledge about less effective or item-oriented strategies.

Jacob and Paris (1987) developed the Index of Reading Awareness to measure the four aspects of metacognition in reading namely: evaluation, planning, regulation, and conditional knowledge. The scale consists of 22 multiple choice items which was assessed by McLain, Gridley, and McIntosh (1991), who obtained preliminary reliability and validity data and found the scale only marginally acceptable. They also found the reliability index (.61) to be “minimal” and stated that the scale “should be used cautiously as a measure of metacognition in reading” (p.81).

Pereira-Laird and Deane (1997) developed the Reading Strategy Use to assess the students’ cognitive and metacognitive reading strategy use. Several items from the scale do not appear to be reading strategies; all items were forced into

predetermined factors (metacognitive and cognitive) on the basis of judges' ratings, and it was said that the researchers skipped exploratory factor analysis.

Zhang and Wu (2009) developed a 28-item survey of reading strategies (SORS) which consists of 3 categories namely: Global, Problem-solving, and Support in order to assess the metacognitive awareness and reading-strategy use of Chinese senior high school students who are learning English as a foreign language (EFL). The analysis showed that the students on the whole displayed characteristics of active strategic readers. They were conscious of their cognitive process during reading and were able to utilize a wide array of EFL reading strategies to achieve comprehension.

In addition, Mokhtari and Reichard (2002) developed the Metacognitive Awareness of Reading Strategies Inventory (MARS) to assess adolescent and adult readers' metacognitive awareness and perceived use of reading strategies while reading academic or school-related materials. The same 3 reading strategy categories namely Global, Problem-solving, and Support were used as subscales. Results showed that there were significant differences in the use of Global and Problem-Solving Strategies by self-reported reading ability but no significant differences in the use of the Support Strategies by self-reported reading ability. Moreover, previous studies were not able to utilize the 5 components of reading. Thus, in the current study, the researchers considered examining the 5 components of reading essential in education.

### *Five Essential Components of Effective Reading Instruction*

**Phonemic Awareness.** According to Allor (2002), “phonological processing is the ability to understand and use the sound system of the language to process the written and oral language.” (p.48). An example of phonological awareness is phonemic awareness. It is defined as oral language skill that involves the understanding of sentences that are made up of phonemes or individual sounds.

**Phonics.** The main goal of phonics instruction is to teach students to decode the alphabet and use this knowledge to decode the words. It could be a combination of “consonant letters and sounds and short and long vowel letters and sound and vowel and consonant diagraphs (e.g. oi, ai, sh, th)” (p. 394) stated by Ehri et al (2001). Furthermore, it is concerned with the visual symbols of the written language.

**Vocabulary.** Bauman et al (2003) stated that vocabulary instruction is “how to derive word meanings through morphemic analysis and infer word meaning through contextual analysis”. (p. 448). In addition, vocabulary is a combination of words in a specific language as whole.

**Reading Fluency.** The National Reading Panel (1999) stated that a combination of effective instruction of phonemic awareness, phonics or sound blending, guided oral reading and vocabulary comprehension can increase the accurate and fluent reading.

***Reading Comprehension.*** Reading comprehension is the basis of literacy acquisition. According to Onwugbuzie et al (2004) “reading comprehension represents the reader’s ability to integrate effectively and meaningfully apply acquired knowledge with the information provided in the text.” (p.444). This kind of skill is an integration of between the schema and the acquired information.

Although there are researches about metacognitive awareness, they did not focus on the 5 essential components of reading namely: Phonemic Awareness, Phonics, Reading Fluency, Vocabulary Development, and Reading Comprehension. Thus, the present article describes a self-reported instrument, the Metacognitive Reading Awareness Inventory, which is designed to explore the tertiary level students’ reading awareness. Investigating on the students’ metacognitive awareness can unveil their reflections and judgments on the various processes of inhibiting frequently, consciously, and voluntarily pattern of such behavior. With this, the researchers want to examine the reliability and validity of the scale that they have constructed. Furthermore, the researchers want to confirm if the items constructed are appropriate for each subscale.

## Method

### *Test Design*

The test design used for the scale was confirmatory factor analysis. In particular, the researchers confirmed and verified the 5 essential components of reading namely: Phonemic Awareness, Phonics, Reading Fluency, Vocabulary Development, and Reading Comprehension.

### *Search for Content Domain*

Though the 5 essential components of reading were not investigated by researches, the researchers found support in Mokhtari and Reichard (2002), who authored Metacognitive Awareness of Reading Strategies Inventory (MARS), which includes the 3 reading strategy categories namely: Global, Problem-solving, and Support. In addition, Zhang and Wu (2009) authored a 28-item survey of reading strategies (SORS) which also consists of 3 reading strategy categories. The National Reading Panel Report (National Institute of Child Health and Human Development [NICHD], 2000) confirmed that an effective reading instruction addressed the 5 reading components. They also included the definitions of the 5 reading components which aided the researchers to formulate content domains.

### *Item Writing and Review*

The items were written based from the definitions researched regarding the five reading components. The items were then reviewed by a professor in Applied English and Linguistics. From the suggestions given, some items were revised and

after reviewing, the affective scale was constructed. Also, it was suggested that the scaling technique should be changed into an even number.

### *Scaling Technique*

The researchers used a 4-point Likert Scale (very typical of me, typical of me, not typical of me, very not typical of me) in order for the respondents to make a definite choice.

### *Procedures*

Initially, the researchers generated the Metacognitive Reading Awareness Inventory from which the final set of items was revised and constructed. The revised instrument was administered to randomly selected 300 De La Salle University-Manila students. It was made sure that none of the participants have/had specific learning problems or conditions. Each participant was given a Metacognitive Reading Awareness Inventory form made by the researchers themselves. At the same time, the researchers entertained the students' questions. Ample time was given to the students in completing the inventory form. After gathering the 300 inventory forms, the researchers encoded the scores.

### *Data Analysis*

***Cronbach's Alpha.*** This method is appropriate for items scored with values other than 1 or 0, such as an essay item that might be scored using a 5-point scale. Like the K-R formulas, Cronbach's alpha represents an average correlation that would be obtained over all split-halves of the test. Cronbach's alpha is a measure of internal consistency and is the most widely used and reported method for estimating the reliability of test scores (Magno & Ouano, 2008; Shoemaker, 2006).

***Split-half.*** Split half is used to measure the consistency of responses. In split-half, the items of the test are split into two parts, and the scores for the parts should show consistency. This is to determine whether the scores within the same test are homogenous. There are various ways of splitting the test into two parts (e.g., random distribution, separating the odd with the even numbers). Split half is usually used for personality and mental ability tests, where the tests have many items to make them reliable. Split-half is examined by getting the sum of the total scores for each half of the scale before correlating the total scores in pairs. Yielding a high correlation coefficient would signify that the responses in the test are internally consistent. Spearman-Brown is then used by doubling the length of the test since only half of the test is correlated (Magno & Ouano, 2008). Since it is often difficult and inefficient to develop two parallel tests, a more common approach is to split the current test into two equivalent halves and correlate those test scores together. One method is to use the odd-numbered items as one half of the test, and the even-numbered items as the second half of the test. The correlation between the two halves is an estimate of reliability of the test. In this case, the correlation coefficient











obtained were of acceptable values (*less than 0.7*). Consequently, the scale can be considered internally reliable and valid as well.

In testing the validity of the scale, confirmatory factor analysis was used. The researchers were able to confirm if the subscales can be considered under metacognitive awareness. Two models were utilized to verify if the five factors can be further divided. It appears that the second model, which was the five factor model showed significant differences with their respective parameters. Factors considered under metacognitive reading awareness were Phonemic Awareness, Phonics, Reading Fluency, Vocabulary Development, and Reading Comprehension. In the reading process, awareness and monitoring are in itself what it seems to be metacognitive. For the past years, researchers who have conducted studies regarding comprehension of unskilled and skilled readers have found out that metacognitive awareness is particularly important in proficient and skilled readers (Mokhtari et al., 2002). Comprehension, one of the reading components, is considered a complex interaction of language, sensory perceptions and memory. According to Mason (1984), reading comprehension, characterizes the ability of reader in which in effectively integrates the other reading components. Apparently, no research was found that the manifest variables can be distributed into higher and lower ordered thinking skills. However, Bloom's taxonomy measures and provides a way/method in organizing such thinking skills, which highly involve metacognitive reading awareness. Each manifest variable vary, depending on the usage and situation, thus, the six major categories of Bloom's taxonomy can be used interchangeably.

After testing the subscales with the latent variables, items corresponding to each of the subscales were also tested using confirmatory factor analysis. The goodness of fit resulted that Phonics and Reading Comprehension were not significant manifest variables. Phonics is not a major factor but a basis of metacognitive reading awareness while Reading Comprehension is not a factor of metacognitive reading awareness but a result of using different reading strategies.

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### Appendix

#### Final Form: METACOGNITIVE READING AWARENESS ITEMS

Phonemic Awareness- the ability to recognize the individual sounds or phonemes in spoken words.

1. I can make new words by adding or replacing a letter with another.
2. I can identify common sound/s between words.
3. I can split words into individual sounds.
4. I can recognize a word even if a letter is removed.
5. I can use letters to form different words.
6. I can identify the sound of the letters.
7. I can divide sounds into words.
8. I can pronounce words clearly.
9. I can blend sounds in order to form a new word.
10. When playing word games such as Scrabble, Word Factory, Text Twist, BookWorm, and the like, I have no difficulty forming words.
11. I can make a new word by replacing or adding a sound/s with another.
12. I can decode unfamiliar words.
13. I can form connections between the visual representation and the word.
14. I segment the letters of a word to understand it.
15. I can make full connections between the sequence of letters and its pronunciation.
16. I can identify the suffixes/prefixes used in a word.
17. I enjoy learning new words one at a time.
18. I can easily recognize unfamiliar words in print.
19. I ask another person if I could not pronounce a word.
20. I can notice the position and movements of the lips, tongue and teeth when someone speaks.

Phonics- the ability to use individual letters or groups of letters to form words.

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- 1. I can read and spell words accurately.
- 2. I can combine vowels and consonants to form words.
- 3. I can recognize letters by name.
- 4. I can sound out multisyllabic words.
- 5. I know that by changing a letter in a word, I can change its meaning.
- 6. I can spell the words at ease without any mistakes.
- 7. I can pronounce the letters of alphabet clearly.
- 8. I can decipher a new word by linking it to a familiar word.
- 9. I can easily identify the sound and letter relations based from my past knowledge.
- 10. When reading, I convert letters to sound to form recognizable words.
- 11. I enjoy learning new words everyday.
- 12. I apply new words that I encountered when I read.
- 13. I practice the correct pronunciation of words.
- 14. I blend sounds to read the word.

15. I break spoken words with their corresponding sounds so I can write it.
16. I can acquire new words and use it in my everyday conversations.
17. I try my best to write the spelling of the new word that I acquired.
18. I ask the speaker to repeat the word again when I hear it.
19. I am easily distracted if I can't pronounce a word.
20. I could read alone confidently.

Reading Fluency -the ability to read words accurately and smoothly with speed and correct expression.

1. I easily recognize the words in the text rapidly and accurately.
2. I can read a text with accuracy.
3. I can read the text with speed.
4. I can read the text with expressions.
5. I practice reading aloud to develop my fluency.
6. I use my own reading strategy/technique.
7. I read the text word by word without any mistakes.
8. I try to go back and read if I don't understand the text.
9. I can read sentences with appropriate facial expressions.
10. I can pronounce unfamiliar words with ease and confidence.
11. I read the text at least twice.
12. I prefer someone reading the text for me first before I read it by myself.
13. I read along as the teacher reads the text aloud.
14. I read the text aloud for better understanding.
15. I stutter when I read aloud.
16. I monitor my fluency by recording my reading performance.
17. I practice reading in front of the mirror.
18. I can read with different pacing.
19. I can show emphasis on some words when reading.
20. I am confident whenever my teacher asks me to read a text out loud.

Vocabulary Development-it refers to a student's knowledge of the meaning of words.

1. Whenever I encounter a new word I try to apply it in my conversations.
2. I use new words that I learned in sentences.
3. I try to define the new word I learned in my own words.
4. I use the dictionary to look for unfamiliar words.
5. Whenever I read I would list down unfamiliar words.
6. I try to know the synonyms of the new word I encounter.
7. I try to know the antonyms of the new word I encounter.
8. I try to apply the new word I encountered in my future conversations.
9. When I learn a new word, I try to imagine or illustrate (visually) the word's meaning.
10. When I encounter a new word, I check if that word was repeated in the same text.
11. When I encounter a new word, I add it to my list.
12. I have a list of words which I want to learn.

